

North Griffin Stormwater Detention Pond Project

Project Description: An important function of wetlands is their role in maintaining and enhancing water quality. Urban storm water contains a variety of constituents including nitrogen, phosphorus, metals, oil and grease that may contribute to nonpoint source pollution. Many complex chemical and biological processes that affect water quality occur within wetlands. A vegetated wetland system can incorporate and transform many of these storm water constituents through biological breakdown by microorganisms or vegetative decomposition.

In addition to providing water quality enhancing attributes, constructed wetland systems offer other potential advantages including: comparatively simple operation with low maintenance; process stability under varying environmental conditions; and low construction and operating costs when compared with traditional water treatment facilities. Additionally, the introduction of emergent wetland species not only provides several benefits for water quality enhancement, but also results in improvement of wildlife habitats.



In 1997, the City of Griffin began a comprehensive watershed management program by implementing a Stormwater Utility to address its aging infrastructure and improve the quality of stormwater runoff. One of the first projects successfully completed under the City's watershed management program was construction of the North Griffin Regional Detention Pond (NGRDP). This regional pond was designed for flood control and to enhance and preserve water quality in Shoal Creek and Wildcat Creek of the Flint River Basin.



NGRDP features a drainage channel, regional detention pond, and two constructed wetland areas for stormwater filtration. The pond and wetland areas use natural filtration and other biological processes to improve the quality of stormwater runoff, rather than traditional mechanical methods. The pond serves as a comprehensive stormwater management system that eliminates flooding problems in a specific area of North Griffin while enhancing water quality.

To determine overall performance of the wetland system, an evaluation of water quality was performed through the collection and laboratory testing of stormwater samples from locations upstream, within, and downstream of the detention pond. A baseline sampling protocol was developed to establish the initial quality of storm water runoff from the North Griffin Drainage Basin.

The following table shows average and theoretical removal efficiencies for several constituents at two monitored stations in the NGRDP (data collected between Jan 99 and Dec 99). The monitored constituents in milligrams per liter (mg/L) include: Total Suspended Solids (TSS), Total Kjeldahl Nitrogen (TKN), Total Phosphorus (Total P), Chemical Oxygen Demand (COD), Total Lead (Total Pb), and Total Zinc (Total Zn).

Removal Rates				
Constituent	Station 1 (Influent)	Station 3 (Effluent)	Average Removal Efficiency	Theoretical Removal Efficiency ¹
TSS	53.00 mg/L	32.75 mg/L	38%	65 to 80%
TKN	1.23 mg/L	1.21 mg/L	1%	60 to 80%
Total P	0.14 mg/L	0.09 mg/L	39%	25 to 50%
COD	50.50 mg/L	30.75 mg/L	39%	35%
Total Pb	0.03 mg/L	0.03 mg/L	0%	50%
Total Zn	0.14 mg/L	0.08 mg/L	42%	60 to 70 %

1-Treatment Wetlands, Robert H. Kadlec and Robert Knight, 1996

Guidance Specifying Management Measures for Non-Point Source Pollution in Coastal Waters, USEPA, 1993

Collected data indicates that the actual removal efficiencies, early in the project, are showing significant reductions in the constituents listed. It is anticipated that these removal efficiencies will continue to improve as the onsite grassing and wetland vegetation mature and that the results will be comparable to the theoretical removal efficiencies of a mature site.

The City of Griffin and Integrated Science & Engineering were awarded the 2000 Engineering Excellence Award from the American Consulting Engineers Council for this project.

Lead Agency: City of Griffin, Office of Public Works

Funding: EPA 319: \$93,850 **Matching:** \$62,566

Project Location: GA, Griffin; Shoal Creek and Wildcat Creek, Flint River Basin

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Link: The North Griffin Regional Detention Pond: Wetland Filtration for Nonpoint Source Pollution Control http://www.forester.net/sw_0106_north.html#nonpoint